

FAST FLUX TEST FACILITY

HEARING
BEFORE THE
SUBCOMMITTEE ON
ENERGY RESEARCH AND DEVELOPMENT
OF THE
COMMITTEE ON
ENERGY AND NATURAL RESOURCES
UNITED STATES SENATE
ONE HUNDRED SECOND CONGRESS

FIRST SESSION

ON

S. 395

TO REQUIRE THE SECRETARY OF ENERGY TO ESTABLISH THE FAST
FLUX TEST FACILITY AS A RESEARCH AND DEVELOPMENT CENTER
TO BE KNOWN AS THE RESEARCH REACTOR USER COMPLEX

MAY 9, 1991



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FAST FLUX TEST FACILITY

THURSDAY, MAY 9, 1991

U.S. SENATE,
SUBCOMMITTEE ON ENERGY RESEARCH AND DEVELOPMENT,
COMMITTEE ON ENERGY AND NATURAL RESOURCES,
Washington, DC.

The subcommittee met, pursuant to notice, at 2:15 p.m., in room 366, Dirksen Senate Office Building, Hon. Wendell H. Ford, presiding.

OPENING STATEMENT OF HON. WENDELL H. FORD, U.S. SENATOR FROM KENTUCKY

Senator FORD. I understand Senator Adams has gone to vote, therefore I do not think I will make anybody unhappy if we go ahead and start. Everybody has the afternoon's work to do, so Senator Gorton, if you want to proceed, I would be delighted to have you start. But let me make a brief statement before we start.

The Subcommittee on Energy Research and Development will receive testimony on the Department of Energy's Fast Flux Test Facility, the FFTF. We will also receive testimony on S. 395, a bill introduced by my good friends from Washington, Senator Adams and Senator Gorton.

The FFTF is a test reactor built by the Department of Energy and located in Richland, Washington. It is a billion-dollar, world-class test facility. It was built during a period when the Federal Government was expanding. It was built at a time when we believed our resources for advanced technologies were unlimited. In those days, we could not build enough new facilities and high-tech gadgets.

Sadly, we are now in a time where the budget for research and development is shrinking rather than growing. We are consolidating our resources rather than expanding them. There simply are not enough Federal dollars to go around.

As a result we have having to make some very hard decisions about what the Federal Government can afford to support. Some of these decisions make good financial sense, but often they do not make good common sense.

The FFTF is one of those projects that has been caught in the financial squeeze. It has provided service to a number of different programs over its 10-year life. It has also achieved a number of records in its own right for operating efficiency. But it is without a primary mission, and so it is a candidate for closure.

I must commend my colleagues from Washington for their efforts to find alternative sources of funding for the FFTF. The Washington delegation has been relentless in its efforts.

I am pleased to see the introduction of S. 395. It would establish FFTF as a user-complex and authorize DOE to charge for the services of the facility. This bill is progressive and forward looking, and I commend my colleagues for introducing it. If it will help in the effort to find outside sources of funding for the FFTF, then I believe personally it is worthy of support.

[The text of S. 395 follows:]

102D CONGRESS
1ST SESSION

S. 395

To require the Secretary of Energy to establish the Fast Flux Test Facility as a research and development center to be known as the Research Reactor User Complex.

IN THE SENATE OF THE UNITED STATES

FEBRUARY 7 (legislative day, FEBRUARY 6), 1991

Mr. ADAMS (for himself and Mr. GORTON) introduced the following bill; which was read twice and referred to the Committee on Energy and Natural Resources

A BILL

To require the Secretary of Energy to establish the Fast Flux Text Facility as a research and development center to be known as the Research Reactor User Complex.

1 *Be it enacted by the Senate and House of Representa-*
2 *tives of the United States of America in Congress assembled,*

3 **SECTION 1. RESEARCH REACTOR USER COMPLEX.**

4 (a) **PURPOSE.**—The purpose of this section is to estab-
5 lish the Fast Flux Test Facility as a multi-mission center for
6 the purpose of conducting research and development on iso-
7 topes and energy, to be operated by the Department in part-
8 nership with international and domestic user organizations.

1 (b) ESTABLISHMENT.—Not later than 90 days after the
2 date of enactment of this Act, the Secretary shall establish a
3 research, development, and production center at the Hanford
4 Reservation in Richland, Washington, to be known as the
5 “Research Reactor User Complex” (hereafter in this section
6 referred to as the “RRC”).

7 (c) AGREEMENTS; AUTHORIZED USES.—In establish-
8 ing the RRC, the Secretary shall provide that the Depart-
9 ment, and any contractors under contract with the Depart-
10 ment to operate the RRC, may enter into agreements with
11 non-Federal entities (including foreign governments and for-
12 eign entities) or a consortium of such entities to use the RRC
13 for any of the following purposes:

14 (1) The production of industrial and medical iso-
15 topes for use or sale, or both, by the non-Federal enti-
16 ties who have entered into the agreement.

17 (2) Irradiation services to support research or
18 commercial objectives, or both.

19 (3) The production of steam to be used or sold, or
20 both, by the non-Federal entities who have entered
21 into the agreement.

22 (d) CHARGES.—The Secretary may assess such charges
23 from non-Federal entities under an agreement entered into
24 pursuant to subsection (c) as the Secretary determines may

1 be necessary or appropriate to implement the purpose of this
2 section.

3 (e) PERIOD OF AGREEMENT.—The Secretary shall not
4 enter into an agreement pursuant to subsection (c) for a
5 period of time exceeding 25 years.

6 (f) TERMINATION PROVISIONS.—(1) Under an agree-
7 ment entered into pursuant to subsection (c), the Secretary
8 may include a termination provision that requires the Depart-
9 ment to pay for the unamortized balance of any special facili-
10 ties acquired or constructed by the non-Federal entities who
11 have entered into the agreement if—

12 (A) the RRC is shut down for lack of Federal
13 appropriations; and

14 (B) the acquisition or construction of the special
15 facilities constitutes a significant portion of the invest-
16 ment by the non-Federal entities under the agreement.

17 (2) A termination provision described in paragraph (1)
18 may authorize the use, for the purpose of paying such un-
19 amortized balance and any other costs resulting from termi-
20 nation, of any Federal funds available for operating expenses
21 pursuant to subsection (k)(2).

22 (3) For purposes of this subsection, the term “special
23 facilities” means any depreciable buildings, structures, utili-
24 ties, machinery, equipment, materials, or services not made
25 available to non-Federal entities by the Department.

1 (g) OTHER AGREEMENT PROVISIONS.—Under an
2 agreement entered into pursuant to subsection (c), the Secre-
3 tary may—

4 (1) make available to non-Federal entities facili-
5 ties, equipment, utility services, fire protection, and
6 other similar services;

7 (2) lease real or personal property to non-Federal
8 entities to carry out the purpose of this section;

9 (3) include an appropriate indemnification pursu-
10 ant to section 170 d. of the Atomic Energy Act of
11 1954 (42 U.S.C. 2210); and

12 (4) include such other terms and conditions as the
13 Secretary determines will implement the purpose of
14 this section.

15 (h) COMPETITIVE PROCEDURES.—In entering into a
16 contract with a non-Federal entity pursuant to subsection (c),
17 the Secretary may use procedures other than competitive
18 procedures as described in section 303 of the Federal Proper-
19 ty and Administrative Services Act of 1949 (41 U.S.C. 253).

20 (i) PROVISIONS RELATING TO DEPARTMENT OF
21 ENERGY CONTRACTOR.—A contractor under contract with
22 the Department to operate the RRC shall—

23 (1) maintain and operate the Fast Flux Test Fa-
24 cility under contract with and for the account of the

1 Department pursuant to section 110 of the Atomic
2 Energy Act of 1954 (42 U.S.C. 2140);

3 (2) ensure that all experiments meet applicable
4 safety requirements and acceptable criteria; and

5 (3) provide necessary support services to the non-
6 Federal entities that have entered into agreements pur-
7 suant to subsection (c).

8 (j) RRC FUND.—(1) There is established in the Treas-
9 ury of the United States a separate fund to be known as the
10 “RRC Fund”. The RRC Fund shall consist of all amounts
11 received by the Secretary from charges assessed under sub-
12 section (d).

13 (2) Subject to appropriations, the Secretary may make
14 expenditures from the RRC Fund each fiscal year to offset
15 the cost of operating the RRC in such fiscal year. Amounts in
16 the RRC fund not needed for operations shall be invested in
17 United States securities, the proceeds of which shall accrue
18 to the RRC Fund.

○

Senator FORD. Senator Gorton.

**STATEMENT OF HON. SLADE GORTON, U.S. SENATOR FROM
WASHINGTON**

Senator GORTON. That was a wonderful opening statement, Mr. Chairman. I was delighted to hear that expression of support. And I need to apologize, as you well know, that we all have conflicting dates and I have to go on to another hearing in which I sit back there.

Thanks for giving my colleagues and me an opportunity to express our strong support for the Fast Flux Test Facility commercialization bill. The legislation is necessary to provide vital and explicit statutory framework for the establishment of the FFTF as a research reactor complex. Existing law and regulations are not adequate to support the full range of uses envisioned under FFTF commercialization.

Let me begin by taking a moment to tell the committee why the FFTF is worth saving. First, it has had a superb operating record since it began full power operations in 1982. It has run on schedule 97 percent of the time while carrying out experiments, an achievement that few other advanced technology facilities can match.

Second, FFTF has perhaps the broadest and most unique capabilities of any of DOE's operating nuclear test reactors. While there are other DOE reactors capable of performing materials tests, field performance experiments, and other advanced reactor research, none has the size and unique instrumentation of the FFTF.

Third, the operators and staff of the FFTF are well trained and highly skilled individuals. They are dedicated to the safe operation of the facility in pursuit of research schedules and goals. These people are a unique national asset that must be considered as we consider the future of the FFTF.

It is unfortunate that this Nation decided more than a decade ago not to proceed with the development and commercialization of fast breeder reactors. France and Japan are aggressively pursuing fast breeder reactor commercialization and stand to reap great benefits from the use of this technology. The FFTF marketing team has identified specific areas within these countries fast breeder reactor programs in which FFTF can make useful contributions. Nuclear experts in both countries recognize the superior achievements and unique capabilities of the FFTF, and are befuddled by DOE's attempts to shut the facility down.

Creating a framework for international collaboration at the FFTF makes a great deal of sense for everyone concerned. It complements U.S. long-term nuclear energy development goals, as it will enable us to keep one of our premier facilities operating. It will also keep us close to the cutting edge of advanced reactor work being done in Europe and Japan. If we do not collaborate, we will not be able to keep pace with technological advances being made abroad in nuclear energy research.

At the same time, collaboration offers foreign entities benefits that are not available in their own programs. This is evidenced by the interest which the FFTF marketing team has generated overseas, and about which you will hear from subsequent witnesses.

Let me explain why this legislation is necessary. Some have argued that existing law and regulations are adequate to allow DOE to enter into cooperative arrangements with non-DOE entities. In my view, however, the relevant statutes and some of the regulations require more explicit authority to allow internationalization of FFTF.

First, it is quite clear that the existing statutes, sections 33 and 161(U) of the Atomic Energy Act, were not meant to address the complex institutional arrangements that will be necessary to commercialize and internationalize the FFTF. These statutes were intended to provide limited contracting authority to the old Atomic Energy Commission for work conducted outside the auspices of the AEC. At the time at which the act was passed, all non-DOE entities with a possible interest in such nuclear work were commercial firms in the United States.

Second, the Department of Energy will need to be actively involved in establishing an institutional framework to allow Japanese and/or European nuclear entities to be genuine participants in the management of FFTF. Such complex institutional arrangements, whether bilateral or multilateral, cannot be accomplished under current statutes and regulations. I believe that explicit government-to-government agreements will have to be drafted to accommodate these activities.

Within these negotiated agreements there will be many provisions that would be questionable under current U.S. law. For instance, foreign users of the facility will be likely to demand certain protections against premature termination of the FFTF. Current law gives no guidance as to the contractual rights of non-DOE users if DOE were suddenly to terminate the facility. Also, what would DOE's liability be if it refused to cooperate with certain provisions of the joint operating agreement? These are all issues which certainly will arise in discussions with potential FFTF users.

This legislation establishes a framework on which we will be able to build a successful research reactor complex. The existing statutes are not sufficient to accomplish this task. Passage of the bill will also send an important signal to potential foreign users of FFTF. A strong congressional commitment to the FFTF will be an important factor as they decide how to allocate their research funds.

I appreciate the subcommittee's consideration of this legislation, and particularly your interest, Senator Ford, and urge it to act expeditiously to ensure its passage.

Senator FORD. Thank you. Senator Adams, we see that you have voted. We are moving right along, so we look forward to your testimony.

STATEMENT OF HON. BROCK ADAMS, U.S. SENATOR FROM WASHINGTON

Senator ADAMS. Thank you very much, Mr. Chairman. I first want to thank you for convening these hearings and for your interest in the FFTF. I would like to thank the committee, and in particular yourself, for holding this hearing and making it possible for

us to present our case so that we can pass this critical juncture and not lose the FFTF. This is a very important day for all of us.

The FFTF is a facility that is important to our state, it is important to our Nation, and I believe in many ways it is important to the entire world community. I am therefore especially appreciative of the hearing today. As you know, Senator Ford, I am not usually known as a great supporter of nuclear reactors, but the FFTF is a test reactor that I embrace wholeheartedly. The country should do likewise.

The FFTF is a reactor that is uniquely able to create pure medical isotopes that are needed for treating and diagnosing deadly diseases, like brain and liver cancer. The FFTF pushes the boundaries of reactor technologies and provides an excellent test bed for fuel designs needed for IFR or PRISM development. It has the potential to destroy long-lived nuclear waste. I would like to repeat that, Mr. Chairman, the FFTF has the potential to destroy long-lived nuclear waste, and that is a major problem in our state and throughout the entire Nation.

This reactor has received plaudits for its past operations. It has received an outstanding engineering achievement award and has been universally acclaimed by its international users. In 1990 the Japan Economic Journal suggested that Japan should help fund the FFTF research program. The FFTF is the only Department of Energy reactor that meets NRC standards and it is one of the few DOE facilities to receive a good review during the recent Tiger Team review. The FFTF is the youngest, most efficient, and most reliable test reactor in the world today.

With all of these rave reviews you may be wondering why this panel has to be here at all, and I sort of wonder about that myself, Mr. Chairman. The problem is the Department of Energy. In spite of the fact that the FFTF is safe, clean, and widely acclaimed, the Department of Energy wants to close this test reactor down. I do not understand that, because the DOE will sink billions of dollars into upgrading 40-year old facilities and will put hundreds of millions into buildings that do not stand a chance of becoming operational. Yet it does not want to continue operating a new facility with a good track record.

I would hope the committee at some point has an opportunity to visit this facility, as I have. It is new, clean, well kept up, and presents great contrast to many of the other facilities we have to deal with.

The entire Washington delegation is committed to the FFTF and has worked hard to keep this facility open. In recent years we have had to fight administration efforts to underfund and shut down the FFTF. So far we have been successful. Still, it is recognized that there needs to be some permanent fix on the FFTF.

Toward this fix, the Governor of Washington and Westinghouse Corporation have put together a marketing team to assess a potential market for FFTF users and to try to secure contracts with current and potential users of the FFTF. This team has met with a lot of encouragement and some success. Negotiations are currently underway regarding a commitment from the Japanese. We should have some definite ideas about this within the next few months. The Germans have offered to donate fuel test assemblies to the

FFTF, a donation that could ultimately be worth tens of millions of dollars.

The marketing team has also determined that there is a significant potential market for medical isotopes that could be produced in the FFTF. Altogether, the FFTF marketing assessment indicates that up to one-half of the FFTF operating costs could be assumed by non-Federal entities within 5 years. A users conference on the FFTF is scheduled to be held in Washington State the latter part of this month.

In the Congress, bills have been introduced on both the House side and the Senate side to try to bolster this marketing effort.

The Senate version, as referred to by Senator Gorton, is S. 395, the Fast Flux Test Facility Commercialization bill.

S. 395 would establish the FFTF as a research and development center. This center would be operated by the Department of Energy in partnership with international and domestic user organizations. The bill would allow DOE to enter into contracts with non-Federal entities to produce medical isotopes, to provide irradiation services, and to produce steam. DOE would also charge for the use of FFTF. For those who buy into this center, the bill requires DOE to reimburse companies for their investments in the FFTF should the reactor research complex be shut down for lack of funding.

This bill would take an important step forward in ensuring the continued operation of the FFTF. It would help encourage investment in the FFTF, particularly in areas like medical isotope production, where capital outlays are required before commercial production could start. I would encourage the inclusion of S. 341 in the National Energy Security Act of 1991.

Mr. Chairman, I would like to reiterate to this committee that the FFTF is a modern, clean DOE facility that has won awards for its successes. Further, there is a potentially large commercial market for its products. There are too few DOE facilities that can make those claims. It would be tragic to toss the FFTF, a national asset, away.

Thank you, Mr. Chairman, for listening to my testimony.

Senator FORD. Thank you very much, Senator Adams.

I have been joined now by Senator Domenici, the ranking member of the subcommittee. Senator, do you have a statement you would like to make?

STATEMENT OF HON. PETE V. DOMENICI, U.S. SENATOR FROM NEW MEXICO

Senator DOMENICI. Thank you, Mr. Chairman. My statement is very brief. I would ask to put it in the record.

Senator FORD. Without objection. It will be included in the record.

[The prepared statement of Senator Domenici follows:]

PREPARED STATEMENT OF HON. PETE V. DOMENICI, U.S. SENATOR FROM NEW MEXICO

The legislation we are considering to convert the Department of Energy's Fast Flux Test Facility to a research and development center substantially funded by sources outside the government seems to me to be, in its overall concept, a welcome approach to dealing with expensive government facilities that are no longer needed to support DOE's programs. Certainly, fiscal responsibility dictates closure of such

facilities by DOE; however, common sense points to the absurdity of dismantling the facility if it can be useful in applications outside federal government programs.

Senators Gorton and Adams have proposed what may prove to be a reasonable and workable solution to this dilemma. If non-federal funding can be secured to defray all or most of the cost of operating the facility, I see at this point little reason to preclude attempts to do so.

Our witnesses today presumably will be affording us better insight into the pros and cons of the approach taken in the proposed legislation. I look forward to their testimony.

Senator FORD. Congressman, we are delighted to have you here. Congressman Morrison, what district do you represent?

**STATEMENT OF HON. SID MORRISON, U.S. REPRESENTATIVE
FROM WASHINGTON**

Mr. MORRISON. The 4th District, Mr. Chairman, which includes the area of the location of the Fast Flux Test Facility.

Senator FORD. We look forward to your testimony.

Mr. MORRISON. Thank you for holding this hearing. My usual experience, being sandwiched between Senator Adams and Senator Gorton, as they say it all and say it very well, I will try not to repeat and to be brief, primarily to fill you in on what we are doing in the House in the same regard.

First I want to assure you that this issue of the threats to the Fast Flux Test Facility have brought the Washington State delegation together. Speaker Foley and the rest of us on the House side feel very strongly about this issue. And again, we all join in thanking you for this hearing.

The Fast Flux Test Facility is a remarkable laboratory at a critical crossroads, and the commercialization legislation before you today is an important component of our effort by the delegation, by the governor of the State, by the Westinghouse Electric Corporation, by the Department of Energy, all represented here today, to build a future for this plant. The effort is now focused on bringing non-Federal and international partners into the FFTF's operating mix to share in the costs and the benefits of a multiuser research reactor complex. In a larger sense, this marketing endeavor, now focused on the Japanese, represents an opportunity for the United States to take a leadership role in creating a truly global energy research effort. And I might add, Mr. Chairman, that the same concept, this commercialization package is applicable in other sites, as potentially other Department of Energy facilities are pressed to find additional activities and additional funding.

My colleagues on the House Science, Space and Technology Committee's Energy Subcommittee have recognized the importance of the FFTF by supporting our delegation's two primary thrusts on behalf of this plant this year. The subcommittee has authorized enough funding in fiscal year 1992 to allow the marketing effort to succeed, and that is important. The subcommittee has included legislation identical to S. 395, that you have under consideration today, in its authorization package.

Our entire delegation has also requested support from the House Appropriations Committee for enough funding to continue to operate the plant until March 31 of next year, when the success or the failure of the marketing effort will be determined, and then to redirect those funds into the safe and orderly shutdown of the plant

should our marketing efforts fail. S. 395 and your support for the FFTF can help this effort succeed, and we mean that sincerely.

For the folks I represent within the district, the FFTF represents many different things. It is a technology center we can all take pride in, an example of an advanced nuclear facility in the middle of an agricultural area which enjoys the enthusiastic support of every sector. As was mentioned by my colleagues in the Senate, the plant's 10-year operating history is a success story worth building on, for our State as a high technology cornerstone, and for our Nation as an energy research and isotope production center, and so that we might seize leadership in global effort in the energy research area.

Mr. Chairman, again, thank you for your leadership in providing this hearing on the FFTF and legislation that is important to us as we reach out. I would be happy to answer any questions you might have.

[The prepared statement of Mr. Morrison follows:]

PREPARED STATEMENT OF HON. SID MORRISON, U.S. REPRESENTATIVE FROM
WASHINGTON

Mr. Chairman, members of the Committee and staff, thank you for this opportunity to focus on a project important to the future of the citizens of the State of Washington. I am pleased to join my colleagues, Senator Adams and Senator Gorton, to share my thoughts on a priority of ours which has united our entire delegation.

As you know, Hanford's Fast Flux Test Facility is a remarkable laboratory at a critical crossroads. The FFTF commercialization legislation before you today is an important component of an effort by our Congressional delegation, the Governor of our State, Westinghouse Electric Corporation, and the Department of Energy (all of which are represented here today), to build a future for this plant. This effort is now focused on bringing non-federal and international partners into the FFTF's operating mix to share in the costs, and the benefits, of a multi-user research reactor complex. In a larger sense, this marketing endeavor, now focused on the Japanese, represents an opportunity for the United States to take a leadership role in creating a truly global energy research effort.

My colleagues on the House Science, Space and Technology Committee's Energy Subcommittee have recognized the importance of the FFTF by supporting our delegation's two primary thrusts on behalf of the plant this year. The Subcommittee has authorized enough funding in FY 1992 to allow the marketing effort to succeed. And the Subcommittee has included legislation identical to S. 395 in its authorization package. Our entire delegation has also requested support from the House Appropriations Committee for enough funding to continue to operate the plant until March 31, 1992, when the success, or failure, of the marketing effort will be determined, and to redirect those funds into the safe and orderly shutdown of the plant should the effort fail. S. 395, and your support for the FFTF can help this effort succeed.

For the folks I represent, the FFTF represents many things. It is a technology center we can all take pride in, an example of an advanced nuclear facility in the middle of an agricultural area which enjoys the enthusiastic support of every sector. The plant's ten year operating history is a success story worth building on; for our state, as a high technology cornerstone; and for our nation, as energy research and isotope production center and so that we might seize leadership a global effort in the energy research.

Mr. Chairman, I thank you again for your leadership in providing this hearing for the FFTF, and I would be happy to answer any questions you may have.

Senator FORD. Thank you, Congressman Morrison. I do not believe I have any questions. You have answered most of the questions that I have, and most of my questions will be directed toward the Department of Energy. They might be a little warm before we get through.

Now, we have been joined by Senator Craig. Senator, do you have a statement you would like to make or a question you would like to ask of the Congressman?

Senator CRAIG. No questions, Mr. Chairman, other than to welcome Congressman Sid Morrison to this committee. I had the privilege of entering the Congress with Sid back in 1980 and have enjoyed working with him. He does a marvelous job representing his district and these most important interests, and we will see what we can do to help.

Mr. MORRISON. Thank you, Senator, and thank you, Mr. Chairman.

Senator FORD. The next witness is Tom Hendrickson, Principal Deputy Assistant Secretary for Nuclear Energy, and we will be pleased to hear your testimony. If you want to highlight it, your entire statement will be included in the record.

STATEMENT OF TOM A. HENDRICKSON, PRINCIPAL DEPUTY ASSISTANT SECRETARY FOR NUCLEAR ENERGY, DEPARTMENT OF ENERGY

Mr. HENDRICKSON. Thank you, Mr. Chairman. I am pleased to have this opportunity to present the Department of Energy's views regarding S. 395, which would require the Secretary of Energy to establish the Fast Flux Test Facility at the Hanford Reservation in Washington as a research and development center, to be known as the Research Reactor User Complex.

At the outset, let me emphasize that the Department continues to support Washington State Governor Booth Gardner's initiative, authorized by Congress, to seek alternatives to Government funding to continue operation of the Fast Flux Test Facility.

I would like to take a moment to describe why the Department has proposed shutdown of this facility. Out of concern for cost effectiveness, the Office of Nuclear Energy conducted a comprehensive evaluation of long-term missions for the Fast Flux Test Facility. We determined that the amount of work done there, predominantly work done under the Advanced Reactor Program, did not justify the expense of its continued operation. Essential testing done in the Fast Flux Test Facility could be done in the Experimental Breeder Reactor-II at much less total cost to the Government.

However, the Department took the process much further. Before making a decision to propose shutdown of this major facility, Admiral Watkins directed that the Department make a thorough re-examination of the Fast Flux Test Facility's original mission and explore options for the continued use of the facility. Missions examined included support for the Advanced Liquid Metal Reactor Program, production of plutonium 238 for space power systems, the potential burn-up of defense waste, production of medical and industrial isotopes, irradiation tests for space and defense applications, irradiation tests for the fusion program, irradiation tests for the New Production Reactor Program, and the possible addition of power generating facilities.

After examining these many alternatives within the priorities and resources of the Department, we regretfully concluded that the

substantial Government funding required to continue operation of the facility was not warranted.

Since that time we have been actively involved in Governor Gardner's initiative to find alternatives to Federal funding of the facility. Governor Gardner asked Westinghouse, which was the designer, constructor, and the current operator of the facility under contract with the Department of Energy, to assist him in that effort. To demonstrate the Department's support, I personally participated in a delegation sponsored by Governor Gardner, which visited the Japanese Government and private institutions in February of this year. This delegation, organized by Westinghouse, was seeking to interest the Japanese in participating in an international program of advanced liquid metal research using the Fast Flux Test Facility as a research center. In April, I visited Japan again to speak before the Japan Atomic Industrial Forum, and I had several additional discussions with Japanese officials about the potential interest in the facility.

Based on these discussions, it is clear that the value to Japan of participating in an international research program using the Fast Flux Test Facility is well recognized and acknowledged. The difficulties cited most frequently by the Japanese were the problems of organizing the wide variety of Japanese agencies and institutions with interest in nuclear energy to take advantage of the opportunity, and the incompatibility between the Japanese Government's fiscal cycle, which begins in April, and the U.S. Government's fiscal cycle, which as you know, begins in October.

Westinghouse will continue to work with various Japanese institutions and agencies to resolve these difficulties with the objective of having an agreement for cooperation in place as early as possible in 1991. To further support Governor Gardner's initiative to find alternatives to Federal funding for the facility, we provided support and funding for a recent meeting between Westinghouse representatives and members of the European nuclear research community. We are also providing support and funding for an international symposium conducted by Westinghouse at the Fast Flux Test Facility site in late May to discuss the technical utilization of the facility, to which Japanese and European organizations are planning to send representatives.

Now that I have outlined why the Department has proposed to shut down the Fast Flux Test Facility, and the support the Department is giving to Governor Gardner's initiative, I would like to address the provisions of S. 395.

While the Department questions whether it is feasible for the Fast Flux Test Facility to be used for all of the purposes identified in the bill, we fully support the fundamental objectives of the bill, that is, to offer the complex for non-Federal use and funding.

It is our conclusion, however, that S. 395 is not needed to accomplish this. Existing statutes and the annual appropriations process currently provide the Department with the authority to offer the complex for full or partial non-Federal use or funding. For example, section 1(d) of the bill provides the Secretary authority to "assess such charges . . . as the Secretary determines may be necessary or appropriate." The Secretary of Energy already has the

authority to charge fees or require financial contributions from non-DOE users.

Section 1(j)(1) of the bill establishes a separate fund, the Research Reactor User Complex Fund, for operation of the Fast Flux Test Facility. The Department questions the need for such a fund and how it would be operated. Furthermore, the pertinent question is not how to account for non-Federal funding but rather, whether sufficient interest exists on the part of foreign or domestic non-Federal organizations to provide a stable, long-term funding commitment for the Fast Flux Test Facility.

As I have described, the process under Governor Gardner's direction for determining the degree and extent of this interest is underway. It is our hope that sufficient interest develops in the international fast reactor community and other commercial users to justify continued operation of the Fast Flux Test Facility with non-Federal funding.

In the April 25, 1991, markup of the Energy Technology Research and Development Authorization Act of 1991 before the House Committee on Science, Space, and Technology's Subcommittee on Energy, the Department's fiscal year 1992 request for First-of-a-Kind Engineering, the SP-100 Program, and the Space Exploration Initiative were not fully supported, while funding was provided for the continued operation of FFTF. Also at that markup, H.R. 910, which is the House version of S. 395, was incorporated as section 10 of the draft authorization act.

The Department has fully supported Governor Gardner's initiative for the Fast Flux Test Facility, and we understand that increased funding for FFTF in fiscal year 1992 may be considered. However, our position is that funding for higher priority nuclear energy programs should not be reduced to provide funds for the Fast Flux Test Facility, particularly since, in the absence of finding alternatives to Federal funding for the FFTF, our fiscal year 1992 budget request assumes appropriate actions will be taken to initiate shutdown of the facility.

In closing, I want to reemphasize the Department's support of Governor Gardner's initiative to find alternatives to Federal funding for the Fast Flux Test Facility. I thank you for the opportunity to appear before you, and I would be happy to answer any questions you may have.

[The prepared statement of Mr. Hendrickson follows:]

PREPARED STATEMENT OF TOM A. HENDRICKSON, PRINCIPAL DEPUTY ASSISTANT
SECRETARY FOR NUCLEAR ENERGY, DEPARTMENT OF ENERGY

Mr. Chairman, I am pleased to have this opportunity to present the Department of Energy's views regarding S. 395, which would require the Secretary of Energy to establish the Fast Flux Test Facility (FFTF) at Hanford, Washington as a research and development center, to be known as the "Research Reactor User Complex."

At the outset, let me emphasize that the Department continues to support Washington State Governor Booth Gardner's initiative, authorized by the Congress, to seek alternatives to Government funding to continue operation of FFTF.

I'd like to take a moment and describe why the Department has proposed shutdown of this facility. Out of concern for cost effectiveness, the Office of Nuclear Energy conducted a comprehensive evaluation of long-term missions of FFTF. We determined that the amount of work done there, predominantly work done under the Advanced Reactor Program, did not justify the expense of its continued oper-

ation. Essential testing done in FFTF could be done in the Experimental Breeder Reactor-II, at much less total cost to the government.

However, the Department took this process much further. Before making a decision to propose shutdown of this major facility, Admiral Watkins directed that the Department make a thorough reexamination of FFTF's original mission and explore options for the continued use of FFTF. Missions examined included support for the Advanced Liquid Metal Reactor program, production of Pu-238 for space power systems, potential burn-up of defense waste, production of medical and industrial isotopes, irradiation tests for space and defense applications, irradiation tests for the fusion program, irradiation tests for the New Production Reactor program, and the possible addition of power generating facilities.

After examining these many alternatives within the priorities and resources of the Department, we regretfully concluded that the substantial government funding required to continue operation of FFTF was not warranted.

Since that time, we have also been actively involved in Governor Gardner's initiative to find alternatives to Federal funding of FFTF. Governor Gardner asked Westinghouse, as the designer, the constructor, and the current operator of FFTF under contract with the Department, to assist him in this effort. To demonstrate the Department's support, I personally participated in a delegation sponsored by Governor Gardner which visited the Japanese Government and private institutions in February. This delegation, organized by Westinghouse, was seeking to interest the Japanese in participating in an international program of advanced liquid metal reactor research using FFTF as a research center. In April I visited Japan again to speak before the Japan Atomic Industrial Forum, and I had several more discussions with the Japanese officials about potential interest in FFTF.

Based on these discussions, it is clear that the value to Japan of participating in an international research program using FFTF is well recognized and acknowledged. The difficulties cited most frequently by the Japanese were the problems of organizing the wide variety of Japanese agencies and institutions with interests in nuclear energy to take advantage of the opportunity, and the incompatibility between the Japanese government fiscal cycle, which begins in April, and the U.S. government fiscal cycle, which, as you know, begins in October.

Westinghouse will continue to work with various Japanese institutions and agencies to resolve these difficulties, with the objective of having an agreement for cooperation in place as early as possible in 1991. To further support Governor Gardner's initiative to find alternatives to Federal funding for the FFTF, we provided support and funding for a recent meeting between Westinghouse representatives and members of the European nuclear research community. We are also providing support and funding for an international symposium by Westinghouse at the FFTF site in late May to discuss the technical utilization of the facility. Japanese and European organizations are planning to send representatives.

Now that I've outlined why the Department has proposed to shut down FFTF, and the support the Department is giving to Governor Gardner's Initiative, I would like to address the provisions of S. 395.

While the Department questions whether it is feasible for FFTF to be used for all of the purposes identified in the bill, we fully support the fundamental objectives of the bill—to offer the complex for non-federal use and funding.

It is our conclusion, however, that S. 395 is not needed to accomplish this. Existing statutes and the annual appropriations process currently provide the Department with the authority to offer the complex for full or partial non-Federal use or funding. For example, section 1(d) of the bill provides the Secretary the authority to "assess such charges . . . as the Secretary determines may be necessary or appropriate." The Secretary of Energy already has the authority to charge "fees" or require financial contributions from non-DOE users.

Section 1(j)(1) of the bill establishes a separate fund (the "Research Reactor User Complex Fund") for operation of FFTF. The Department questions the need for such a fund and how it would be operated. Furthermore, the pertinent question is not how to account for non-Federal funding, but rather, whether sufficient interest exists on the part of foreign or domestic non-Federal organizations to provide a stable long-term funding commitment for FFTF.

As I have described, the process under Governor Gardner's direction for determining the degree and extent of this interest is underway. It is our hope that sufficient interest develops in the international fast reactor community and other commercial users to justify continued operation of FFTF with non-Federal funding.

At the April 25, 1991, mark-up of the Energy Technology Research and Development Authorization Act of 1991 before the House Committee on Science, Space, and Technology's Subcommittee on Energy, the Department's FY 1992 requests for

First-of-a-Kind Engineering, the SP-100 Program, and the Space Exploration Initiative were not fully supported, while funding was provided for the continued operation of FFTF. Also at that mark-up, H.R. 910 (the House version of S. 395) was incorporated as Section 10 of the draft Authorization Act. The Department has fully supported Governor Gardner's initiative for FFTF, and we understand that increased funding for FFTF in FY 1992 may be considered. However, our position is that funding for higher priority Nuclear Energy programs should not be reduced to provide funds for FFTF, particularly since, in the absence of finding alternatives to Federal funding for the FFTF, our FY 92 budget request assumes appropriate actions will be taken to initiate permanent shutdown of FFTF.

In closing, I want to reemphasize the Department's support of Governor Gardner's initiative to find alternatives to Federal funding of FFTF. I thank you for the opportunity to appear before you, and I would be happy to answer any questions you may have.

Senator FORD. Thanks very much, Tom. Let me go through a little history, if I may, and maybe you can bring me up to date and change my thoughts a little bit. But here is the way that I kind of look at the history of the FFTF. It was built as a part of the liquid metal breeder program that grew significantly through the 1970's, is that not correct?

Mr. HENDRICKSON. Yes, sir, that is correct.

Senator FORD. About 1983 or thereabouts the breeder program was effectively terminated when we canceled the Clinch River project, and at that time the Department made a number of changes in the focus of its program. And as I recall one of these was to plan for a shutdown of the older breeder test reactor, which is the EBR-II in Idaho. Is that correct?

Mr. HENDRICKSON. Yes, sir.

Senator FORD. That shutdown, of course, did not occur. Instead, over the past 10 years, programs have been moved from the FFTF to the older EBR-II. Now, what was the reason for the change in philosophy?

Mr. HENDRICKSON. Mr. Chairman, I do not see it as a change in philosophy, and let me explain that. The EBR-II reactor is based on a metal fuel cycle. The Fast Flux Test Facility, like the Clinch River Breeder Reactor, is based on an oxide fuel cycle. As time has progressed and experience has grown with both types of fuel—the metal fuel and the oxide fuel—we have seen distinct advantages for the metal fuel system, and the advanced liquid metal reactor program is based on the metal fuel system as used in the Experimental Breeder Reactor-II. It is true that we have run some metal fuel assemblies for test in the Fast Flux Test Facility, but those tests were completed.

Senator FORD. Well, can the EBR-II reactor do everything the FFTF could?

Mr. HENDRICKSON. Well, the FFTF, Mr. Chairman, is a larger facility, and therefore, it is more costly to operate. The EBR-II facility is very suitable for the metal fuel cycle, which is the reference fuel cycle for the advanced liquid metal reactor program.

Senator FORD. Well, the EBR-II is much older and smaller, and to me would it not make sense over the long term to keep the FFTF instead of the older EBR-II?

Mr. HENDRICKSON. Mr. Chairman, we examined that question very thoroughly early in 1990. What we determined was that there would be substantial capital investment required to bring the infrastructure for the metal fuel cycle to the Fast Flux Test Facility,

and the cost of operating the facility would be approximately twice as much on an annual basis. We also determined that we were able to run the test programs required to support the advanced liquid metal reactor program at the Experimental Breeder Reactor-II.

Let me point out that its design life is something on the order of 40 years. It is now 27 years old, and there is certainly sufficient life remaining for the foreseeable experimental work required in support of the advanced liquid metal reactor program.

Senator FORD. Did many of those who were looking at both plants change other than the Secretaries of Energy?

Mr. HENDRICKSON. I think very few people changed, Mr. Chairman, because this review was performed by the staff of the Office of Nuclear Energy.

Senator FORD. Well, what I am getting at, then, is that in 1983 you made a decision to close down the older one, and then shortly thereafter you made a decision to close down the newer one and keep the older one open. That seems like a change in direction or pressure for change in another direction.

Mr. HENDRICKSON. Yes, sir, I cannot speak with authority on that because it was long before my tenure in the Department. I have tried to find out what the logic was for the decisions, and I have informed you what they were.

Senator FORD. Well, if the decision is made to keep the FFTF open, what programs will the Department conduct there?

Mr. HENDRICKSON. Mr. Chairman, the answer to that is if the FFTF remains available it would be considered, along with all other Department of Energy facilities, on its technical merits and on the costs, and we would run programs there that were technically suitable and/or cost effective.

Senator FORD. You have run programs there that were suitable and cost effective, so that indicates that it has been doing what you have asked it to do within the budgetary process and the final results?

Mr. HENDRICKSON. Yes, sir.

Senator FORD. Give me some kind of a range of possible test programs that could be carried out at the FFTF.

Mr. HENDRICKSON. We could run some advanced liquid metal reactor, metal fuel assemblies in the reactor again. The reactor is larger, and therefore we could use longer fuel assemblies in it, and there is some advantage to that. But there is hardly enough need that I know of that would justify the full cost of that facility.

Senator FORD. You have raised a couple of concerns about the provisions of S. 395, but, and correct me if I am wrong, I understand your position that you do not oppose the bill? You just think it is not necessary, is that correct?

Mr. HENDRICKSON. Mr. Chairman, you are correct.

Senator FORD. My colleagues from Washington obviously think it is necessary. Would you be willing to work with the committee to develop some amendments that might address your concerns and accommodate my colleagues from Washington?

Mr. HENDRICKSON. Yes, Mr. Chairman, I would be more than willing to do that.

Senator FORD. I have no further questions at this moment. Senator Craig.

Senator CRAIG. Thank you very much, Mr. Chairman, and Tom, thank you. We appreciate having you before the committee. I think we are all concerned, those of us who have these marvelous national laboratory facilities in our states, as to our ability to show some flexibility in relation to a form of commercialization or allowing these facilities to be used for diversified purposes that heretofore DOE has not needed to, or has not been asked to. And I must admit that in our instance we are finding a considerable amount of opposition to that kind of an approach to broaden the base of flexibility for these kinds of purposes.

When you look at Fast Flux versus EBR-II and some of the shifts that have occurred there, we are dealing with an older facility in Idaho. What are the cost factors involved? Was that a consideration for changing or moving programs over?

Mr. HENDRICKSON. Senator, we did not change or move programs over. We ran some tests in support of the advanced liquid metal reactor program with metal fuel in the Fast Flux Test Facility. We ran the tests fully to their conclusion. They are finished.

Senator CRAIG. I see. So there were separate tests?

Mr. HENDRICKSON. There were separate tests, yes.

Senator CRAIG. Designed for different purposes?

Mr. HENDRICKSON. Designed for different purposes.

Senator CRAIG. Does DOE accept the argument of the possibility of isotope production coming out of FFTF?

Mr. HENDRICKSON. Yes, Senator. The Isotope Production and Distribution Program is one of my responsibilities. It is a program that amounts to a business volume for the Department of Energy of about \$16 million a year, for which there is a revolving fund. I think what is significant is that the total amount of business in isotopes of all kinds, both radioactive and stable isotopes, amounts to only something on the order of \$16 million. And the portion of that are radioisotopes made in reactors is about \$4 million a year. And so with that perspective it would be very difficult for us to realize a very appreciable portion of the funding of FFTF through the sale of isotopes.

Senator CRAIG. Some argue that there is a potentially larger market out there, and that we see an increasing demand in radioisotopes. Is there anything you have that indicates that?

Mr. HENDRICKSON. Yes, Senator, and I certainly hope so, because there has been a great deal of good done for mankind through nuclear medicine and through radioisotopes. However, you must realize that the Food and Drug Administration regulatory cycle for radiopharmaceuticals is a very stringent and lengthy one involving something on the order of 10 years. So introduction of a new medical radioisotope, although extremely important, is something that will not yield substantial revenues for considerable periods of time.

And may I add that the iodine for the President was manufactured in Canada from targets of highly enriched uranium provided by the Department of Energy. That was the same as for the First Lady's treatment many months ago. There used to be a domestic supplier of iodine 131, there is not today. We have to get it from Canada. And we have asked for a small amount of funding in fiscal year 1992 so that we can go back into that business.

Senator CRAIG. Would that be the type of material that could be produced at this facility?

Mr. HENDRICKSON. The Fast Flux Test Facility would be one type of reactor that could do it. There are others. The Advance Test Reactor we have in Idaho is another one. We have the High Flux Isotope Reactor in Oak Ridge and the High Flux Beam Reactor at Brookhaven, all of which are capable of producing this kind of material.

Senator CRAIG. I have no further questions, Mr. Chairman. Thank you very much, Tom.

Senator FORD. Just a minute, Tom. I have another question I want to ask you. Listening to Senator Craig, the FFTF is only what, about 10 years old?

Mr. HENDRICKSON. Yes, sir.

Senator FORD. And the EBR is 27 or 28 years old?

Mr. HENDRICKSON. Yes, sir.

Senator FORD. One has 30 years of life left and the other one has about 12?

Mr. HENDRICKSON. That is right, sir.

Senator FORD. It is a newer and more state-of-the-art facility, apparently. Senator Adams, I believe, and you might recall what he said, that a study that they had made showed that there was sufficient market to be able to recoup as much as half of the annual operating funds for FFTF. Did I catch that right? Do you believe they can do that?

Mr. HENDRICKSON. Sir, that was a conclusion of a market survey that was done for Governor Booth Gardner by a team of people including Westinghouse people and others in the State of Washington. That is not the Department's conclusion.

Senator FORD. Do you agree with that or disagree with it?

Mr. HENDRICKSON. Well, I would certainly hope that could be attained, but the studies the Department has done on other uses for FFTF do not support that.

Senator FORD. Well, let us just hypothetically say that they reach that 50 percent goal, or close to it. Would that be sufficient in the Department's view to justify the continued Federal support?

Mr. HENDRICKSON. That is a matter on which to my knowledge neither the Department nor the administration has made a conclusion.

Senator FORD. Well, speculate. Take a shot here. Throw yourself out of office.

[Laughter.]

Mr. HENDRICKSON. I did not mean to be evasive.

Senator FORD. I am just kidding you. You know everybody has to run everything through OMB. When they talk about money they have no right to express their own views around here. And I thought maybe this would be a chance for you to express your own view.

Mr. HENDRICKSON. Well, I think 50 percent would be a fine achievement, especially if we could achieve it early on.

Senator FORD. Would that be a threshold that you think—

Mr. HENDRICKSON. I think it would be considered that way, but that is my personal view. I would also hope, though, that the share

of non-Federal funding would increase beyond that as the programs matured.

Senator FORD. I would say if they reached that 50 percent threshold that would begin to grow, because that would give them a very solid foundation on which to build. Thank you very much. Do you have anything else?

Senator CRAIG. Well, Tom did open himself up a bit, although he does not like to speculate. I would say, Tom, that a good many of us in Idaho are anxious to see one of our facilities used out there for a different approach, and I think you probably know what I am talking about when I talk about power burst and BNCT.

Mr. HENDRICKSON. Yes, sir, I do.

Senator CRAIG. It is a great disappointment on the part of many Idahoans of the unwillingness of the Department to be unresponsive to a direct budget request.

Mr. HENDRICKSON. Senator, may I say that that program falls under the Office of Energy Research, and not the Office of Nuclear Energy.

[Laughter.]

Senator CRAIG. Of course, duck while you can.

Senator FORD. After serving on this committee for 14 years with his predecessor, if you have a melt down there would be no more Idaho potatoes. I think you have done very well out there.

Senator CRAIG. We still have a lot of potatoes, and they do not glow.

Senator FORD. I am just saying, it is like they used to say about the southern part of the United States, somebody strikes a match in the wrong place and we will lose Mississippi and Alabama. Thank you, Tom.

Senator CRAIG. Take that message back, Tom.

Senator FORD. Yes, take it back, Tom, and let us see if we cannot find something. We are now going to have a panel of experts. Jeff Breckel, assistant to the Governor of the State of Washington, and Roger C. Nichols, deputy general manager, Government Operations Business Unit, Westinghouse Electric. Gentlemen, welcome.

Jeff, do you want to start?

STATEMENT OF JEFF BRECKEL, ASSISTANT TO THE GOVERNOR, STATE OF WASHINGTON

Mr. BRECKEL. Thank you, Mr. Chairman, Senator Craig. My name is Jeff Breckel, and I have the pleasure of appearing before you this afternoon on behalf of Governor Booth Gardner. The Governor appreciates the opportunity to share his thoughts regarding FFTF and the opportunity to voice his strong support for S. 395.

The State of Washington and the Governor have a very special interest in FFTF. With the Hanford site in transition from the long-term production role, we would like to see its energy research and development functions, which it has carried on for so many years, grow and prosper. And we feel that FFTF is the key stone to that future in energy research and development, and it has the potential to become a multi-mission international research, isotope production facility.

As the previous witnesses have so eloquently stated, FFTF is truly a remarkable facility in terms of its flexibility, its capacity, its operational record, and its staff of very dedicated scientists, technicians, and engineers. In short we believe that FFTF and its 9 short years of operations have demonstrated that it is an important asset, not only to our region but to the Nation and the international community.

In recent years since its commencing operations in 1982, its mission has diversified to fuels testing, materials testing, isotope production, support of international fusion research, and it was, given this record, that the Governor received the announcement by the Department to close this facility with great concern. Secretary Watkins advised the Governor that he regretted this decision, and he noted that DOE missions alone were no longer sufficient to support continued operations of the facility.

In response to this announcement the Governor last year, with \$100,000 in state funds, initiated a market assessment to determine if international and non-Federal domestic users could contribute enough to the operations of FFTF to warrant its continued operations. We dispatched teams last summer to Europe, to Japan, and throughout the United States to meet with radio pharmaceutical companies, and at the end of that assessment, we were very encouraged.

As has been previously noted, that assessment indicated that within 5 years we felt from our discussions that nearly half of FFTF's operating cost could be funded from non-Federal sources. We found widespread acclaim and enthusiasm for FFTF and its unique capabilities, and nowhere was that interest stronger than in Japan, which has embarked upon a very aggressive liquid metal reactor program.

Based upon the results of that assessment, Congress approved funding for continued operation of FFTF in 1991, and endorsed the Governor's marketing effort and encouraged him to continue, and asked the Secretary of Energy to participate. The Secretary has become an active supporter and a participant in this marketing effort. That participation is of critical importance and is greatly appreciated by the Governor, for without the involvement of DOE, the facility's owner, substantive discussions with prospective users just could not have been undertaken.

Westinghouse has also provided technical support as well as marketing support through their own international organization. So we have a very effective marketing team that is in the field now and beginning discussions with prospective users. Our focus has been on Japan since they demonstrated the greatest interest in FFTF during the initial discussions.

As Mr. Hendrickson noted in his testimony, I led a team on behalf of Governor Gardner with Tom and Mr. Nichols from Westinghouse to renew our discussions with the Japanese in February. What we found was that the Japanese had been giving considerable thought to FFTF since our initial discussions last year. They responded very favorably to the proposal in concept of a Japan-U.S. operating partnership for FFTF. They clearly recognized the unique technical capabilities of FFTF, and openly acknowledge its

potential value to their liquid metal reactor program and to international fusion research.

They expressed interest in terms of what form an agreement with the United States might take, and they also understand that unless we can show some progress in the near term in terms of internationalizing the use of this facility and bringing more support, that this facility may be closed permanently.

They did express several reservations. First, they felt like they needed a long-term commitment from this country if they were going to invest sizable amounts of funding in the facility and embark on long-term experimental programs. They needed some assurance that the facility would be available to complete those scientific endeavors. They also indicated that, given their budget cycle, that it would be at least until April of 1992 before funding could be provided, again presuming an agreement with DOE could be reached.

There have been subsequent discussions with the Japanese. They have continued to explore the agreement. They have formed an internal Japanese Government working group to begin discussions among the various entities in Japan on how they could participate. They have indicated that their utilities will be involved in those discussions, and we believe these are very serious demonstrations of their interest.

In addition to our focus on Japan, a discussion with European parties has gone on as noted. Previously both the Germans and the French have expressed considerable interest in terms of using FFTF to support their own European fast reactor program. And the Germans have also offered fuel.

In response to this growing international interest, the State and DOE will host an international symposium in Hanford later this month, and invite participants from Europe and Japan and throughout the United States to come and talk about the technical capabilities of FFTF. I think it is important to stress that this symposium is not just an opportunity for technical discussions. This is the first time that prospective users will come together in one location.

We recognize that in all likelihood no one entity or country could unilaterally support FFTF, but collectively we believe they can. And this forum will allow those parties to come together to discuss their mutual interest in this facility, to explore possible collaboration, and to look at the institutional issues that would be involved in transforming FFTF into an international facility.

How does S. 395 figure in our efforts? It is an important element to success. The legislation, as previously noted, would provide DOE with clear direction and flexibility to enter into long-term agreements which are so critical to prospective domestic and foreign users, particularly the Japanese. Moreover it sends a clear message that the United States is seriously interested in creating a multinational facility and in promoting international collaboration.

In summary our discussions are progressing well. The results are very encouraging but not yet conclusive. We recognize that Congress cannot continue to indefinitely bear the full burden of FFTF funding, but we believe the prospects for securing user agreements by next spring are promising and worth pursuing. The Governor

asks for your help in transforming FFTF into a multi-mission international research and isotope production facility. He urges you to act promptly and favorably on S. 395.

Thank you.

[The prepared statement of Mr. Breckel follows:]

PREPARED STATEMENT OF JEFF BRECKEL, ASSISTANT TO THE GOVERNOR, STATE OF WASHINGTON

Mr. Chairman and Subcommittee Members, my name is Jeff Breckel. I am appearing before you this morning on behalf of Governor Booth Gardner. The Governor appreciates this opportunity to share his thoughts regarding the future of the Fast Flux Test Facility (FFTF) located on the U.S. Department of Energy's (DOE) Hanford Reservation in Washington State and to voice his strong support of S. 395.

THE FFTF—A PROVEN RESOURCE FOR THE FUTURE

The State of Washington has a special interest in the FFTF. It is the keystone to Hanford's continuing role as a center for energy research and development.

As you are probably aware, the Hanford Reservation is in transition. Defense programs, the mainstay of Hanford operations for over four decades, are being phased out. Efforts are now underway to clean up and dispose of the massive quantities of wastes generated by these programs. In addition to its historical role in defense programs, Hanford has also been an important site for the nation's energy research and development efforts. While environmental programs will likely be the site's primary mission for the next several decades, Hanford is also in the position to continue to make important contributions to national as well as international energy programs. And, FFTF is poised to play the central role in these efforts—to become a multi-mission, international research and isotope production facility.

FFTF is the largest, most modern nuclear test reactor in the world. It began operations in 1982 as an experimental reactor in the U.S. advanced breeder reactor program. In the intervening years, DOE has reoriented and diversified its mission to encompass the development and testing of reactor materials, fuels, and components as well as international fusion research and isotope production. FFTF has attracted international clients, including Japan's PNC and JAERI. It has amassed an exceptional operating record and it is staffed by a highly capable and talented staff of technicians, engineers, and scientist. In short, FFTF has in its nine years of operation demonstrated its value as an important state, national, and international asset.

AN ASSESSMENT OF POTENTIAL NEW USERS AND MISSIONS

Given FFTF's record, Governor Gardner received last year's announcement that DOE intended to close the facility with great concern. Energy Secretary James Watkins advised the Governor that he regretted the decision but noted that DOE missions alone could no longer support continued operation of FFTF.

In response to the announcement, the Governor set out to determine if international and commercial uses of FFTF could be increased to a level which would support a portion of long-term operations. One hundred thousand dollars in state funds were committed to this effort. Technical teams were sent to Europe and Japan to meet with government agencies and business involved in nuclear programs. A third team met with radio-pharmaceutical firms here in the United States.

The results were promising. The market assessment indicated that non-federal programs could fund up to one-half of FFTF's annual operating costs within five years. The teams found widespread acclaim and enthusiasm for FFTF and its unique testing capabilities. No where was this interest stronger than in Japan, which has embarked on an aggressive liquid metal reactor program.

A FOCUSED MARKETING EFFORT

As a direct result of these findings, Congress funded FFTF through fiscal year 1991, in hope that new users and funding sources could be found to support continued long-term operations. Late last year, Secretary Watkins joined the Governor to assist in more fully exploring the potential for increasing international and commercial utilization. The Secretary's active support and participation has been critical to the marketing effort and is greatly appreciated by the Governor. Without the

involvement of DOE, the facility's owner, substantive discussions with prospective users could not have been undertaken.

The Governor and the Secretary also asked Westinghouse, the DOE operating contractor for FFTF, to provide technical support. In addition, Westinghouse has contributed invaluable assistance through its international marketing organization.

The expanded campaign to seek out new users has focused principally on Japan. Japan demonstrated the greatest interest in FFTF during our initial discussions last spring. A followup team led by myself, representing Governor Gardner, and Tom Hendrickson, Principal Deputy Assistant Secretary for Nuclear Energy, travelled to Japan on February 20, to renew discussions with Japanese government agencies and nuclear-related businesses. Roger Nichols of Westinghouse coordinated the meetings and led a team of Westinghouse support staff.

The mission to Japan was productive and encouraging. The Japanese responded favorably to our proposal of establishing Japan/U.S. operating partnership for FFTF. They recognize the unique technical capabilities of FFTF and openly acknowledge its potential value to their liquid metal reactor program and to international fusion research. They are clearly interested in gaining access to FFTF and are curious about what form an agreement with DOE might take. They also understand that unless we can show serious interest in FFTF by non-federal users, the facility could be closed permanently.

The Japanese did, however, stress that a U.S. commitment to long-term operations would be critical to their participation in FFTF operations. They further indicated that, given their budget cycle, funding for FFTF could be provided no earlier than April 1992, presuming an agreement could be reached with DOE.

During a subsequent meeting with Mr. Hendrickson and Mr. Nichols, the Japanese reaffirmed their interest in continuing to explore a partnership for the operation of FFTF. An internal Japanese government working group has been established to coordinate discussions on FFTF. The Japanese have also indicated that their major utilities will also be involved in their FFTF discussions. We believe that these steps show serious interest on behalf of the Japanese.

While our principal focus has been on Japan, discussions with European parties have also occurred. A Westinghouse Hanford Company technical team has met with German and French officials. They found considerable interest in using FFTF to support the European Fast Reactor program. The German's have even offered fuel for FFTF.

In response to this growing international interest the State and DOE will host an international symposium at Hanford later this month on the varied technical capabilities and collaborative opportunities offered by FFTF. The symposium will mark the first time that parties from around the world will gather in the same location to discuss the future of this important facility. In addition to discussions on the technical aspects of FFTF, the symposium will also afford the participants the chance to discuss mutual interests, areas of possible collaboration, and institutional issues surrounding the transformation of FFTF into an international research and isotope production facility.

S. 395—AN IMPORTANT ELEMENT OF SUCCESS

S. 395 is an important element in efforts to attract new users to FFTF. This legislation, introduced by Senators Adams and Gorton, would provide DOE the clear direction and flexibility to enter into long-term agreements so critical to prospective domestic and foreign users, particularly the Japanese. Moreover, it sends a clear message that the United States is seriously interested in creating a multi-national facility and in promoting international collaboration in energy research.

SUMMARY

In summary, our discussions with prospective users of FFTF are progressing well. The results are very encouraging but not yet conclusive. We recognize Congress cannot indefinitely continue to bear the burden of fully funding FFTF operations but we believe that prospects for securing user agreements by next spring are promising and worth pursuing. The Governor asks for your help in transforming FFTF into a multi-mission, international research and isotope production facility. He urges you to act promptly and favorably on S. 395

Thank you.

Senator FORD. Mr. Nichols.

STATEMENT OF ROGER C. NICHOLS, DEPUTY GENERAL MANAGER, GOVERNMENT OPERATIONS BUSINESS UNIT, WESTINGHOUSE ELECTRIC CORP.

Mr. NICHOLS. Thank you, Mr. Chairman. I welcome the opportunity to testify before you. As you noted, I am the Deputy General Manager of the Government Operations Business Unit of Westinghouse, which includes in that the responsibility for several of the Government-owned, contractor-operated facilities managed by Westinghouse for the Department of Energy, including the Hanford site where the FFTF operates. One of my jobs in the past for Westinghouse was the senior Westinghouse executive in Asia, living in Japan for 7½ years.

I have a detailed statement which I have submitted for the record, and would like to provide a few comments from the perspective of someone who has lived in Japan and knows and understands the Japanese.

Senator FORD. Without objection, your full statement will be included in the record.

Mr. NICHOLS. Thank you. The previous witnesses have outlined very carefully and very succinctly the success we have had to date in trying to find additional support and funds for the FFTF. As noted, we have focused on Japan because they have expressed the most interest and have been the strongest supporter of use of FFTF since its operation. Many of the Japanese who are currently involved in the liquid metal reactor program in Japan have had assignments at the FFTF, and so they know the facility very, very well.

And in fact in my opinion the continued use of FFTF by the Japanese was a key part of their long range plans, and they, as noted, have expressed concern over the decision by DOE to close the facility and disrupt their plans. When the announcement was made there were several experiments the Japanese had planned to put in FFTF that they had to redirect to a facility in France, the Phoenix reactor, which is currently not operating.

The Japanese have several concerns about the proposal that we have put together, but I am very proud of the proposal because we have offered something of value. We have not gone over and just held out our hand and said please give us money because we are short of money and need money to operate the facility. We have offered them a partnership in FFTF, access to technology from the past, and access to better knowledge about the operations in the future, so they are very, very interested, but do have some reservations, as noted, their concern about the budget cycle offset, the 6 months' difference between their budget cycle and our budget cycle, and can they provide enough funding soon enough to satisfy our requirements and needs.

They are also concerned about the past relationships they have had with the Department of Energy and some programs which have caused them some concern about whether or not the United States is really a reliable long-term partner in some of these businesses.

And thirdly, there is a very large number of organizations in Japan who are involved in this process, and as you well know, the

Japanese process of consensus building takes a very long period of time, and it is very frustrating to us from the United States and Europe as well as they go through this consensus-building process. But it is a vital part of their process of deciding to do something, and we have to have the patience to go along with it and participate in it. And so they are concerned about us moving too quickly before they reach a consensus and want to move ahead.

The Japanese are very, very strong in relationship orientation. They want to build relationships and keep relationships. Relationships are not built easily, but once built are very difficult to disrupt. They have had a very long and strong relationship with the FFTF and are very, very desirous of continuing that relationship.

I believe the bill before you and its companion bill in the House, as Mr. Breckel said, is an important aspect of the marketing effort. It does provide the specificity and the framework necessary to give them the assurance that if they go ahead that there will be a long-term continuity of operations of the FFTF as best we can do it within the annual appropriations process we go through in the United States.

And they go through the same process. There is no blank check in Japan, either, for their energy research programs. And it will also help multinational and international efforts to get others to come to these facilities, and the Japanese would greatly appreciate other participation other than just themselves and the United States in such a facility.

And so I wholeheartedly support the bill and urge your prompt consideration of it. Thank you for the opportunity to testify, and we will be happy to answer questions.

[The prepared statement of Mr. Nichols follows:]

PREPARED STATEMENT OF ROGER C. NICHOLS, DEPUTY GENERAL MANAGER,
GOVERNMENT OPERATIONS BUSINESS UNIT, WESTINGHOUSE ELECTRIC CORP.

Good afternoon, I am Roger Nichols and I am Deputy General Manager of the Westinghouse Government Operations Business Unit which has overall responsibility for several of the Government Owned/Contractor Operated (GOCO) operations of Westinghouse for the Department of Energy (DOE). The Westinghouse Hanford Company (WHC), which operates the Fast Flux Test Facility (FFTF) as well as the Hanford reservation, is part of that business.

BACKGROUND

FFTF, located at Hanford, Washington, is a state-of-the-art 400 MWt, sodium-cooled test reactor. The FFTF is the only U.S. Department of Energy reactor that has undergone the independent Nuclear Regulatory Commission scrutiny normally required for commercially operated reactors. The FFTF achieved full power operation in 1980, and began unrestricted operation in 1982. Since that time notable achievements include records for operating efficiency and continuous operation at full power, fuel burn-up records four times those achieved in the commercial industry, full scale demonstration of passive safety features, demonstration of isotope production capability, and the successful operation of advanced materials tests in support of fusion and space power development.

On January 29, 1990, the Secretary of Energy announced that due to budgetary and mission considerations that the Department of Energy was recommending, subject to congressional approval, the closure of the FFTF in April of 1990. When the decision was announced, there were more than twenty full scale experiments underway supporting U.S. and international programs. Upon review of the recommendation, Congress asked that closure be delayed until October of 1990 and that a careful look be taken at impacts and alternatives. In view of interest and concern for the FFTF, both domestically and internationally, Governor Booth Gardner of the State

of Washington launched an initiative to evaluate funding alternatives outside the DOE. The Governor's initiative was endorsed by the Secretary of Energy.

In April 1990, the Governor and Westinghouse Electric Corporation provided seed funding to support his initiative to evaluate market potential for non-federal users of the FFTF. A group of technical and business experts from Westinghouse, Battelle's Pacific Northwest Laboratory, the State of Washington and the local community was assembled as a marketing team. After review of potential marketing areas, the team was divided into sub-teams which focused on potential European, Asian and domestic users.

During this time, DOE began administrative procedures related to shutting down the FFTF, including meeting with the Japanese and others that had experiments in the facility. The Japanese reaction to DOE's explanation was negative reflecting both the lack of prior notification of termination and the general confusion over DOE's logic. All parties were assured that their interests would not be affected adversely by the decision to shut down the FFTF.

Despite these assurances, the Japanese customers were very distressed by the DOE plans to remove an integral part of their Fast Breeder Reactor (FBR) test program, a fuel irradiation test. Because of the DOE announcement, the Japanese immediately initiated plans to place the irradiation testing in the PHENIX Fast Reactor test facility in France. In addition, the Power Reactor and Nuclear Fuel Development Corporation (PNC) the major Japanese user of the FFTF to date used this opportunity to obtain budget approval from the Japanese Diet for the upgrading of their JOYO, Experimental Fast Reactor (Liquid Sodium) which currently has an output capacity of 100 MWt. The upgrade program was announced as a 70 billion Yen (\$550 million) program over a five year period. Also, investigations were initiated to find an alternative for continuing the international fusion material irradiation testing program then in FFTF. The EBR-II test reactor of DOE in Idaho was considered but rejected by the experimenters as inadequate.

MARKETING ACTIVITIES—1990

The Governor's marketing team began its efforts to solicit support for the Fast Flux Test Facility (FFTF) in North America, Japan, and Europe in the Spring, 1990. In May and June, 1990, various marketing team members met with 22 potential non-Department of Energy (DOE) clients throughout the world. Discussions were held as to how the FFTF could fit into the requirements of the research or energy development plans and activities within their respective organizations.

In general, the response was favorable toward the technical capabilities of the FFTF; it is well recognized throughout the world as being a premier research facility with unique capabilities and a superb operating record. Specifically, the marketing team members focused on four areas where the FFTF could provide a valuable service:

1. Irradiation services, testing, and experiments
2. Operations and balance-of-plant testing
3. Nuclear waste destruction experiments
4. Medical isotope production.

The above can be considered core missions.

Several other issues became apparent during the initial marketing discussions. First, it will take a good deal of patience and time to transform the FFTF from a domestic facility, solely operated by DOE, to an international users facility, managed in a different manner for a variety of purposes. Second, one would have to find some way to assure the long-term operation of FFTF to potential international (and domestic) users. Third, the DOE has to play a more active role in the marketing effort since it is the present owner and authority with management responsibilities. Foreign parties made this issue quite explicit: no further progress could be made unless high level DOE representatives were included in the marketing initiative.

As you know, Congress acted to provide FFTF operating funds for another year for the fiscal year beginning October 1, 1990. It also directed the DOE to seek outside sources of funding in an attempt to secure long-term operational basis for the facility. Based on that direction and previous efforts, Governor Gardner (State of Washington), DOE officials, and Westinghouse Electric Corporation executives entered into further discussions as how best to proceed. Toward the end of 1990, it was agreed that DOE would participate in the marketing initiative and that a trip to Japan should be planned quickly to formally seek Japanese missions and funding for FFTF.

MARKETING ACTIVITIES: 1991

The February marketing team trip focused its initial efforts on Japan because we concluded that most of the potential support and funding would come from Japanese entities. In early 1991, we began meeting with a number of Japanese representatives in Washington, D.C., including officials at the Embassy of Japan, regarding our proposed trip to Japan. They provided useful advice on our preparations for the trip in February. In addition, we met with officials responsible for Japan and international nuclear issues in the Department of State.

One of the first priorities was to send a letter from the U.S. DOE Secretary of Energy (Admiral James D. Watkins) to the relevant ministers in Japan that provided an introduction for the marketing team and stated DOE support for the activities of Governor Gardner and our marketing team. The active support and participation from high-ranking DOE officials is considered essential by the Japanese to make the FFTF a successful international facility. Secretary Watkins did send such letters to the two key ministries involved in this effort: Minister Nakao of the Ministry of International Trade and Industry (MITI), and Minister Santo of the Science and Technology Agency (STA). Copies of the letters, dated February 7, 1991, are attached to my testimony, see Attachment A.

These letters were well received in Japan and provided a positive basis for the meetings held in February. It became much easier to schedule meetings with the appropriate officials in STA and MITI after arrival of the letters in Tokyo. In addition, letters were also sent to the same Ministers by Governor Gardner and the entire Washington State congressional delegation. Copies of these letters are also attached to my testimony, Attachment B.

On February 18-27, the marketing team was in Tokyo to meet with a broad range of agencies and firms in Japan's nuclear community. The team consisted of personnel from Westinghouse Electric Corporation and its subsidiary, Westinghouse Hanford Company, the staff of Governor Gardner, the Department of Energy, and other supporting staff and consultants. The lead members of the team were myself (from WEC), Tom Hendrickson, Principal Deputy Assistant Secretary for Nuclear Energy, and Jeff Breckel, Special Assistant to the Governor's office.

I took the lead in presenting a general proposal for an FFTF partnership in our meetings, which can be described briefly, as follows:

- Develop a new relationship; a partnership with Japan to:
 - Broaden and strengthen existing relations.
 - Improve utilization of the FFTF for mutual benefit.
 - Provide a foundation for expanded international cooperation.
- Potential Benefits to Japan:
 - a. Facility risks are very low
 - The FFTF is built and a success
 - Operations will still be U.S. responsibility
 - Final disposition of the facility will be U.S. responsibility.
 - b. Improved access to existing experience and technology.
 - Lessons learned in start-up and prior operations.
 - Sharing of testing experience.
 - c. Expanded use of access in the future
 - Operational experiences as plant ages.
 - Valuable resource for MONJU and DFBR programs.
 - Possible Steam Generator testing capability.
 - Special operations and safety testing.
 - Potential for nuclear waste transmutation studies.
 - Potential source for medical isotopes.

The partnership proposal would include the creation of a Memorandum of Understanding (MOU) between the governments of Japan and the United States. This MOU would establish the concept of a partnership for the long term operation of the FFTF and an approach for equitable sharing of costs and benefits, as well as for the plant operation. We told the meeting attendees that in order to implement this agreement, an existing agreement could be used, or a new agreement could be negotiated. The team didn't present this concept for an MOU as a fixed proposal, but rather as a means to begin discussion.

Our suggested timing for reaching an agreement on an MOU was April 1991, recognizing the coming congressional budget deadlines. We did, of course, indicate some flexibility on this date.

In summary, we proposed a U.S./Japan partnership to share the FFTF utilization and operating costs for the mutual benefit of both countries. We noted that significant Japanese participation was needed during U.S. FY 1992 in order to demon-

strate the desire for mutual cooperation. Following a formal agreement, the parties could then consider additional international participation in the FFTF.

JAPANESE RESPONSE

It became clear during our trip in February that the lead government agency for this issue would be STA as they have the primary responsibility for developing and overseeing basic research and development related to nuclear energy in Japan. MITI, through its Agency for Natural Resources and Energy (ANRE), is responsible for oversight of the implementation of nuclear energy in the marketplace, i.e., oversight of the electric utilities and ensuring public health and safety. STA is especially important because it has oversight authority over two of the key quasi-government corporations involved in nuclear energy research: PNC (Power Reactor and Nuclear Fuel Development Corporation), and JAERI (Japan Atomic Energy Research Institute). Therefore, most of our efforts since February have been focused on STA officials.

We were pleased that STA Minister Santo decided to send a letter in response to Admiral Watkins' letter. A copy of the letter, dated March 29, 1991, is attached to my testimony, Attachment C. This letter sends a positive message for several reasons: particularly noteworthy is the speed in which this letter was agreed upon, drafted and sent. (This is unusual for any Japanese government agency as generally it is a time-consuming process to arrive at a consensus). Second, the letter mentions that STA will make a "good-faith effort" to give this issue serious consideration and study. In fact, STA has created a special internal task force to study this issue and arrive at a decision to meet the deadlines of Japan's FY 1992 budget process. Third, the letter implies that the scope of the study will be broad and that the STA task force will welcome any ideas or recommendations from the U.S. side. In particular, STA stated that it will consult with electric utilities in Japan.

In our meetings, the Japanese made it clear that they consider the FFTF to be a superior advanced reactor with an excellent operating record. They also mentioned the need for the nuclear communities in the United States, Japan, and Europe to work together cooperatively. Making FFTF an international facility was an idea that was well received in certain quarters in Japan. Furthermore, they emphasized the special importance of maintaining a strong U.S.-Japan bilateral cooperation as well in nuclear energy research. Finally, it became clear that the FFTF could fit into well-defined parts of the nuclear research and development of several Japanese corporations and agencies if it were allowed to continue to operate.

At the same time, however, we realize that several obstacles need to be overcome if we are to succeed. First, DOE and others have to assure the long-term operation of FFTF. Japan's nuclear energy research program, whether its R&D on FBR development, fusion, or waste transmutation—is planned on a ten-to-thirty year time frame. If Japanese entities participate in FFTF, they are clearly looking for some type of assurance for long-term operation. They are also very interested in DOE programs to use FFTF in the future.

Second, the issues of budget amount and timing are critical. We did not propose any specific number for our request of the Japanese entities during our February visit. Yet the Japanese understand that the operating budget of FFTF is substantial and that they are being asked to cover a significant portion. In addition, since our budget cycles are different, we have to address the six-month lag in the start of each fiscal year; October 1st in the U.S. budget—April 1st in the Japanese budget. Unfortunately, we were too late to make an official request for the Japanese budget for FY 1991, which began April 1, 1991. For that reason, the Japanese government cannot provide an official answer to our request by the start of our fiscal year on October 1st. STA officials have indicated, however, that we will know the results of its internal study and its official request to the Ministry of Finance-Budget Bureau, for funding, by the end of August, 1991.

Finally, we realize that Japan's policy of indigenous development of nuclear energy research and development is also an obstacle. For over thirty years, Japanese nuclear entities have tried to wean themselves away from excessive dependence of nuclear technologies developed abroad and to build up their domestic capabilities. There are a number of advanced reactors in Japan in which they carry out advanced R&D. Some domestic-oriented planners want to expand these capacities. At the same time, there are also strong voices that advocate greater international collaboration for Japan's advanced nuclear programs. This ongoing debate within Japan will likely continue for some time.

APRIL TRIP

We decided it would be timely to visit Japan again soon after Minister Santo released her letter to Secretary Watkins. In conjunction with the annual meeting of the Japan Atomic Industrial Forum (JAIF) in Tokyo, we visited Japan again from April 7-11, and contacted the key agencies and firms. Principal Deputy Assistant Secretary Hendrickson addressed the JAIF Conference regarding the National Energy Strategy (NES) that was recently announced by the DOE. Furthermore, Mr. Hendrickson agreed to meet with the appropriate officials in STA, MITI, and other firms on FFTF collaboration. He was accompanied by Jerry Griffith, Associate Deputy Assistant Secretary for Reactor Systems Development and Technology/Civilian Reactor Development.

We had a number of useful meetings with many of the same entities with whom we met in February. Several things became clear from these meetings. First, our proposal for an FFTF partnership had made a visible impact on Japan's nuclear community. Most officials concerned with advanced reactor development are well aware of our proposal and activities. Second, STA officials are making great efforts to gather all relevant information and to consult with the key entities in carrying out its internal study. Unfortunately, the internal task force had not scheduled its first formal meeting by the date of our visit in early April. Yet we were able to meet informally with most of the key players in the agency and had some frank, informative discussions. In general, we feel positive about the direction of the STA study, although we realize there are many obstacles that need to be overcome.

Third, we realized quickly that many technical and institutional issues related to our proposal had to be discussed face-to-face by a large number of senior and mid-level officials in both the U.S. and Japan. For that reason, we are planning an international symposium to be held in Pasco, Washington, from May 28-31, 1991. Although the planning time is extremely short for a symposium of this scope, we concluded from our April meetings that such a symposium will play a crucial role in Japan's decision-making process. DOE has agreed to fund and sponsor this symposium.

Finally, most Japanese stress that a strong commitment from the DOE was necessary to ensure the credibility of the FFTF proposal. It appears that the Japanese entities are not receiving a strong, consistent message about DOE's support for the partnership proposal. To be successful, the Japanese need to perceive this proposal as not solely coming from Governor Gardner and the Westinghouse Corporation—but as a proposal with strong support and leadership from the DOE. We understand this Japanese concern well and believe we have made good progress in responding to it during our two trips to Japan. Certainly, DOE's sponsorship of the international symposium in Pasco in May should help to allay some of these concerns. A copy of the formal invitation letter from Deputy Secretary Henson Moore and Governor Gardner is included as attachment D.

CURRENT STATUS—EUROPE

Dr. Alan Waltar, Manager, Advanced Reactor Programs, and Dr. Dave Lucoff, Manager of FFTF Operations, both of Westinghouse Hanford Company, visited with several European community members. The intent was to explore potential participation on the part of the European community in the "internationalization" of the FFTF. In addition to the direct benefit of European community participation, internationalization is recognized as a key factor to Japanese participation in the operation of the reactor.

The trip was very successful, the French and Germans were both enthusiastic about utilization of the FFTF in support of their European Fast Reactor (EFR) program. Their primary interest is in passive safety testing, they also expressed interest in transmutation and advanced fuels development. In fact, the Transuranic Institute of Germany has requested cost estimates for some near term developmental testing in the reactor. France and Germany have agreed to participate in an International FFTF Utilization Working Group meeting tentatively scheduled for early this May. We anticipate that the Japanese and the United Kingdom will also participate in that meeting, and we've extended an invitation to the IAEA. The primary emphasis of the meeting will be on passive safety testing with secondary discussions on other potential uses of the facility.

The European community typically does not have the financial resources to invest significant funding in the FFTF. Their participation would be in the form of technical expertise and test hardware. However, the Germans have offered in excess of \$50 M worth of fuel for the FFTF. Utilization of this fuel could significantly reduce the operating cost of the FFTF for a period of three to five years.

We are very encouraged by the response we found in Europe and believe that groundwork has been laid for truly internationalizing the FFTF. We envision cooperative programs in passive safety testing, transmutation development, and advanced fuels development that would include the European community, Japan, and the United States.

POTENTIAL FUTURE U.S. PROGRAMS

Funding constraints led DOE to decide that they could not justify continued operation of the FFTF. However, if we are successful in finding partners in that operation, there are numerous U.S. programs that we anticipate would make use of the unique capability of the FFTF.

Passive Safety Testing

The nearest term need for the FFTF is passive safety testing in support of the development of the Advanced Liquid Metal Reactor (ALMR). This reactor program places considerable emphasis on the development and demonstration of passive safety features. The FFTF is the only reactor in the United States capable of performing prototypic scale tests of these features. The international community has also expressed significant interest in these tests.

Metal Fuel Testing

The U.S. ALMR program is based on metal fuel. Several entities, including program review bodies, have recommended that testing of prototype fuel assemblies should be initiated on a priority basis utilizing the FFTF if it continues in operation. Full scale testing is recommended to accurately measure effects impacted by size, the FFTF is the only U.S. reactor with sufficient size for testing of full length fuel pins.

Advanced Fuel Testing

As noted above, metal fuel is the reference fuel for the ALMR program; however, there are problems such as a large void coefficient that still need to be resolved. As a contingency, the U.S. is also studying the potential for nitride fuel. If nitride is determined to warrant more detailed study, the FFTF will be required to provide the necessary fuel performance data base.

Transmutation Testing

The transmutation of nuclear waste constituents is currently being examined as a way to reduce the uncertainties associated with the performance of radioactive wastes disposal systems. In approximately five years the DOE will be ready to perform pilot scale demonstration of waste transmutation. It is anticipated that the FFTF will play a key role in the development and demonstration of this technology to allow successful incorporation into advanced liquid metal reactor designs, as well as provide critical technology for accelerator based waste transmutation systems.

Space Power Testing

Space power development is required to support programs such as the recently announced Space Exploration Initiative (SEI). The development of advanced fuels and materials for space power applications can be significantly enhanced through testing in FFTF. When the DOE determined that full funding of the FFTF could not be maintained, a significant reduction of space power irradiation development tests was required. Continued operation of the reactor will allow resumption of the original plans.

Fusion MOTA

The U.S. is one of the principal users of the Fusion MOTA and had planned to utilize that capability for several more years. Assured long term operation of the facility will allow those plans to proceed.

Commercial Applications

There are two capabilities of the FFTF which lend themselves to commercial applications, isotope production and electrical power generation.

Isotope Production

There is a rapidly growing market for radiopharmaceuticals in the medical industry. Industry projections show that market increasing from the current level of \$200 million per annum to over \$3 billion per annum by the year 2000. Currently the capability to produce these isotopes in the United States is limited. As an example, there is no U.S. facility producing molybdenum-991 the most frequently used isotope

today. Current U.S. needs are purchased from Canada. A recent design study has shown that the FFTF is capable of producing up to one third of the world's requirement for this isotope.

Additional studies have shown that the FFTF is particularly suited for the production of many other isotopes through the use of a "rabbit" vehicle which is now in the design stage. The spectacular market growth projected is in developmental isotopes which would be produced in this "rabbit".

Power Generation

The energy generated by the FFTF is now dissipated to the atmosphere. This energy could be utilized to generate approximately 120 MW of electricity. In 1986 a cooperative agreement was established between the local public utilities and the DOE to explore feasibility of a utility owned power addition to the FFTF. The result was a design, cost estimate, and schedule which showed that a power addition could be completed in four years which would supply electricity at rates comparable with other sources in the Pacific Northwest and California.

The major stumbling block to the power addition project has been the lack of a long term mission for the FFTF. If long term operation of the FFTF can be assured, there is a high probability that investors will be willing to fund the power addition project.

The Important Role of Legislation: S. 395

All that having been said, to successfully attract outside sources of funding for FFTF or for any other federal project for that matter, investors are going to need to know they will get their money's worth and that if they engage in a long-term commitment, the federal government will hold up its end. Unfortunately, in the energy arena, the United States has not always been a reliable partner. S. 395 goes a long way toward allaying many fears the international community has regarding making FFTF part of their programs.

Legislation is before the committee that would establish FFTF as a research and development center to be known as the Research Reactor User Complex. The complex would use FFTF as a multi-mission center for the purpose of conducting research and development on isotopes and energy, to be operated by the Department of Energy in partnership with international and domestic user organizations.

The Atomic Energy Act currently contains some vague and dated provisions which provide generic authority for contracting with non-Federal entities for commercial purposes. It is questionable, however, whether these and other general provisions are sufficiently specific to pertain to FFTF commercialization. Several uncertainties pose complications which could easily prevent DOE from pursuing FFTF marketing and commercialization activities. Accordingly, more specific legal authorities which authorize contracting with non-Federal entities for FFTF's commercial utilization is important.

S. 395 also provides specific protection that FFTF users will demand before they sign contracts including termination provisions which allow the Secretary to require the Department to pay for the unamortized balance of any special facility acquired or constructed by the non-Federal entities if certain conditions are met.

The international community is watching what Congress does. They are not only concerned about the appropriations for FFTF, but this legislation as well. They are very aware of the important role Congress plays in this process. They know that the annual budget/authorization process cannot be eliminated, just as it can't be eliminated in their countries. We do believe, however, that legislation such as S. 395 will go a long way in reducing uncertainty and will act as a clear statement by Congress that recognizes the long-term nature of such international relationships. The United States has the opportunity to gain a great deal of knowledge and experience from the continued operation of FFTF.

[Attachment A]

THE SECRETARY OF ENERGY,
Washington, DC, February 7, 1991.

Her Excellency AKIKO SANTOH,
Minister of State for Science and Technology, The Science and Technology Agency,
Tokyo, Japan.

DEAR MINISTER SANTOH: I am writing to express my support for the initiative undertaken by Governor Booth Gardner of the State of Washington to find new and expanded uses for the Fast Flux Test Facility. The Department reluctantly conclud-

ed early last year that continued operation of the facility was not required in support of United States' nuclear energy programs; however, I strongly believe that the facility has much to offer to the international nuclear community.

The mission of the facility could be directed to support more fully the Japanese nuclear energy program. I believe you will see this as an opportunity of great value because of the recognized capability of the facility for technology development, its demonstrated excellence in operating performance, and the significant contribution it has already made to Japan's advanced reactor development programs.

Governor Gardner has asked the Westinghouse Electric Corporation, which designed, built, and operates the facility under contract with the Department, to assist him in exploring new uses and missions for the facility. A team of representatives from the Westinghouse Electric Corporation and Governor Gardner's staff will be in Japan in February to resume discussions started last spring regarding possible Japanese participation in the operation and use of the Fast Flux Test Facility. Mr. Tom A. Hendrickson, Principal Deputy Assistant Secretary for Nuclear Energy, will join the Governor's team and serve as my representative. I would greatly appreciate your assistance in ensuring that these representatives meet with the appropriate people and organizations in Japan to explore fully this opportunity.

I hope that Governor Gardner's initiative will allow us to continue to work together to support the development of advanced nuclear technologies. I have sent a similar letter to His Excellency Eiichi Nakao, Minister of International Trade and Industry.

Sincerely,

JAMES D. WATKINS,
Admiral, U.S. Navy (Retired).

THE SECRETARY OF ENERGY,
Washington, DC, February 7, 1991.

His Excellency EIICHI NAKAO,
Minister of International Trade and Industry, Tokyo, Japan.

DEAR MINISTER NAKAO: I am writing to express my support for the initiative undertaken by Governor Booth Gardner of the State of Washington to find new and expanded uses for the Fast Flux Test Facility. The Department reluctantly concluded early last year that continued operation of the facility was not required in support of United States' nuclear energy programs; however, I strongly believe that the facility has much to offer to the international nuclear community.

The mission of the facility could be directed to support more fully the Japanese nuclear energy program. I believe you will see this as an opportunity of great value because of the recognized capability of the facility for technology development, its demonstrated excellence in operating performance, and the significant contribution it has already made to Japan's advanced reactor development programs.

Governor Gardner has asked the Westinghouse Electric Corporation, which designed, built, and operates the facility under contract with the Department, to assist him in exploring new uses and missions for the facility. A team of representatives from the Westinghouse Electric Corporation and Governor Gardner's staff will be in Japan in February to resume discussions started last spring regarding possible Japanese participation in the operation and use of the Fast Flux Test Facility. Mr. Tom A. Hendrickson, Principal Deputy Assistant Secretary for Nuclear Energy, will join the Governor's team and serve as my representative. I would greatly appreciate your assistance in ensuring that these representatives meet with the appropriate people and organizations in Japan to explore fully this opportunity.

I hope that Governor Gardner's initiative will allow us to continue to work together to support the development of advanced nuclear technologies. I have sent a similar letter to Her Excellency Akiko Santoh, Minister of State for Science and Technology.

Sincerely,

JAMES D. WATKINS,
Admiral, U.S. Navy (Retired).

[Attachment B]

CONGRESS OF THE UNITED STATES,
HOUSE OF REPRESENTATIVES,
Washington, DC, February 5, 1991.

Her Excellency AKIKO SANTOH,
Minister of State for Science and Technology, Tokyo, Japan.

DEAR MADAM MINISTER: The United States Department of Energy has joined with the governor of the State of Washington and the Westinghouse Electric Corporation in a initiative to sustain long-term utilization of the Fast Flux Test Facility (FFTF) in our state. We are writing to express our support for this effort and to assure you that we are committed to providing the Department of Energy the authority necessary to achieve a international partnership to utilize FFTF in our mutual interest.

Early in 1990, the Department of Energy announced its intention to shut down the FFTF, based on the absence of a definite mission sufficient to justify expenditure of the full operating costs in the current U.S. nuclear energy program. Several subsequent developments have led to the reconsideration of the decision. These include the U.S. Congress' support for FFTF expressed through funding for operation through September 1991, and the initiative of the Governor of Washington to seek alternative ways to support continued long-term operation.

A U.S. team including senior representatives from the Department of Energy, the governor's office and Westinghouse will visit Japan this month to develop a partnership utilizing FFTF which Japan's aggressive energy programs. We want you to know that this effort has our wholehearted endorsement and that we are committed to doing our part to make the effort successful.

Sincerely,

Brock Adams and Slade Gorton, *U.S. Senators*; Thomas S. Foley, Norman D. Dicks, Al Swift, Sid Morrison, Rod Chandler, John Miller, Jim McDermott and Jolene Unsoeld, *U.S. Representatives*.

STATE OF WASHINGTON,
OFFICE OF THE GOVERNOR,
Olympia, WA, January 31, 1991.

Her Excellency AKIKO SANTOH,
Minister of State for Science and Technology, The Science and Technology Agency,
Tokyo, Japan.

DEAR MADAME MINISTER: Early last year U.S. Secretary of Energy James Watkins announced his intention to close the Fast Flux Test Facility (FFTF) at Hanford, Washington. The Secretary cited the lack of a long-term mission for the facility as the reason for his decision.

In response to this decision, I undertook, with the Secretary's support, an effort to explore the possible expansion of international and commercial uses of the FFTF. I did so because I strongly believe that FFTF has much to offer the international research community and isotope industry.

FFTF is the largest, most modern nuclear test reactor in the world. It has a remarkable history of site and reliable operations. It is staffed and operated by dedicated and gifted technicians, scientists, and engineers. And, most importantly, FFTF has repeatedly demonstrated its ability to support important research in the fields of nuclear fuels and materials science, as well as advanced reactor design efforts and isotope production.

To assess the level of interest in this unique facility, I sent my personal representatives to meet with representatives of your organization and others in Japan. They also met European nuclear officials and representatives of the U.S. and European isotope industries. My representatives found widespread acclaim and enthusiasm for FFTF. They also found considerable interest, particularly in Japan, in exploring new and expanded uses of the facility.

As a direct result of these findings, Congress has continued to fund FFTF through fiscal year 1991 in hope that new users and funding sources can be found quickly to support continued long-term operations. Secretary Watkins has also agreed to work closely with me to explore potential new uses for FFTF and to actively pursue user agreements with interested parties.

It is for those reasons that Secretary Watkins and I are sending a team to Japan to follow up on the discussions begun last spring regarding potential Japanese participation in FFTF. I believe that such discussions are in the mutual interest of both nations. It is my hope that together we can agree on specific measures which will

ensure the long-term success of FFTF as a multi-mission international research facility.

The team will be comprised of Jeff Breckel of my office; Tom Hendrickson, Principal Deputy Assistant Secretary for Nuclear Energy and Secretary Watkins' personal representative; and representatives of the Westinghouse Electric corporation. I have asked Westinghouse to participate because of its extensive and invaluable knowledge of FFTF and its capabilities.

Your cooperation and support of this initiative will be greatly appreciated. I ask your assistance in ensuring that my representatives have the opportunity to meet with the appropriate representatives of your organization as well as others who may be interested.

Sincerely,

BOOTH GARDNER, *Governor.*

[Attachment C]

SCIENCE AND TECHNOLOGY AGENCY,
PRIME MINISTER'S OFFICE,
Tokyo, Japan, March 29, 1991.

His Excellency JAMES D. WATKINS,
The Secretary of Energy, Admiral, U.S. Navy (Retired), Washington, DC.

DEAR ADMIRAL WATKINS: Thank you for your letter dated 7 February, 1991 regarding the potential utilization of the Fast Flux Test Facility (FFTF) at Hanford, Washington.

There is no question that the FFTF over the decade has made a significant contribution to the development of fast breeder reactors (FBR), not only in the U.S. but also in Japan and in other countries. Its large size and superior capabilities for carrying out advanced tests and experiences for advanced reactors are well recognized. Furthermore, Japan is grateful for the chance to utilize the FFTF by several Japanese entities through mutual cooperation between our two countries. This cooperation has made a substantial contribution to our nuclear development program.

Unfortunately, the decision by your Department to shut down the FFTF operations caught people in Japan's nuclear circles by surprise and caused them a good deal of embarrassment. As a result of your announcement on FFTF last January, one of our nuclear research institutions had no choice but to commit itself to an alternative research and testing program with another country, in order to meet its goals and schedules.

I, however, appreciate your efforts in writing me and helping to establish the initiative that your Department and others have undertaken for the purpose of finding alternative uses for the continued long-term operation of the FFTF. My staff appreciated the opportunity to hear and discuss frankly the proposal of the U.S. Team. My staff has reported to me that the FFTF Team had a series of useful and productive meetings in Japan.

Let me add, however, that it is already too late to change any of the funding programs for our agency's budget for the 1991 fiscal year, which begins April 1, 1991 and ends March 31, 1992. Moreover, the government agencies in Japan face severe budget constraints, and as a general proposition, securing new financial resources for the purpose of FFTF would be very difficult. There are many other competing demands on our budgetary resources in advanced nuclear energy research. Nevertheless, I have asked my staff to initiate a good-faith effort to study the FFTF proposal thoroughly. They will be consulting with all relevant parties and institutions including electric utilities.

In order to facilitate our internal discussions, I would very much welcome from your side any additional information on the FFTF and its capabilities as well as suggestions on the modes of U.S.-Japan cooperation on this facility.

Sincerely yours,

AKIKO SANTO,
*Minister of State
for Science and Technology.*

[Attachment D]

INTERNATIONAL SYMPOSIUM

On May 29 through 31, the U.S. Department of Energy and the State of Washington will host an international symposium at Hanford on the varied technical capabilities and collaborative opportunities offered by the Fast Flux Test Facility (FFTF). We would like to cordially invite representatives of your organization to attend and participate in these proceedings.

Over the past year, our representatives have met with numerous organizations in Japan, Europe, and North America to explore opportunities for expanded international collaboration and commercial utilization of FFTF. The response has been very positive. FFTF's unique capabilities are widely recognized and acclaimed throughout the international community. Moreover, considerable interest has been expressed in pursuing new and expanded uses for the facility.

The purpose of this upcoming symposium will be to further discussions on research and commercial opportunities. Our principal focus will be on detailed explanations of FFTF's diverse and flexible technical capabilities. Among the topics scheduled for discussion are advanced reactor development, passive safety testing, fusion research, waste transmutation, and isotope production for medical and industrial purposes.

The symposium marks the first time that parties from around the world will gather in the same location to discuss the future of this important facility. In addition to learning more about the technical aspects of FFTF, the symposium will also afford the participants the chance to discuss mutual interests, areas of possible collaboration, and institutional issues surrounding the transformation of FFTF into an international research and isotope production facility.

We have asked Westinghouse, as the facility's operator, to take responsibility for organizing the symposium. They will be contacting your organization in the near future to discuss the schedule and details of the conference. In order to ensure that the program fully addresses your interests, we hope that you will share any thoughts you may have on the proposed agenda.

We sincerely hope that your organization will be well represented at this conference. We believe that the time is right for members of the international nuclear energy community to meet together and discuss the future of this important research and this unique research facility.

Sincerely,

HENSON MOORE,
*Deputy Secretary, U.S. Department of
Energy.*

BOOTH GARDNER,
Governor, State of Washington.

Senator FORD. Thank you very much, Mr. Nichols. Let me ask both of you, and Jeff, you might start, what could the Department of Energy be doing better to help you in your effort?

Mr. BRECKEL. Mr. Chairman, I think we are very appreciative of the efforts that the DOE has undertaken in behalf of our marketing effort. I think what I need to stress here, however, is that we need their continued active support and participation in the marketing effort. Again, it is not possible for the State of Washington or for Westinghouse to embark on substantive discussions with regard to use of the facility that neither one of us owns.

DOE must be at the table with us. They must be willing and eager to reach an agreement with our foreign users, to assure them that perhaps some of the events that have transpired in the past with regard to a determination of international facilities or international experiments will not be repeated. They have been delivering that message with us on our prior contacts with users, but we need that continued support. I have no reason to believe that they will not continue that support.

Senator FORD. Mr. Nichols, do you have anything to add?

Mr. NICHOLS. I would argue with that observation. DOE has provided the financial resources to undertake this effort through allowing Westinghouse, as the operator of the facility, and the technical arm of Westinghouse to support the effort. But there is going to come a point when the Japanese want to sit down and discuss in detail what is going to happen in the future and how will DOE participate in the operation of FFTF and, as you asked, what programs will they run. And those kind of questions have to eventually be answered.

Senator FORD. This may be putting you a little bit on the spot to put you in conflict with the Department of Energy, but your company designed and built the FFTF and you are intimately acquainted with what it can and cannot do. Mr. Hendrickson, in his testimony earlier this afternoon, said the EBR-II was cheaper to operate and could accomplish everything the FFTF could. In your opinion can it or can it not do that? And in your opinion what additional programs could be carried out by the FFTF either by DOE or others?

Mr. NICHOLS. I think Mr. Hendrickson's testimony said that the EBR-II could accomplish all those things that the Department felt were necessary to support its current program in liquid metal reactors and fuel development. I think they readily admit the FFTF, because of its size, larger size, larger core, higher flux, and instrumentation capability, can do other things that EBR-II cannot do. It is just that the current programs that they have on their plate and in their budgets do not require those kinds of capabilities.

We believe there are substantial new experiments that could be done in support of the existing LMR direction of the Department of Energy as well as international programs, and I have outlined several of those in my written testimony. There is a passive safety testing process that the Europeans and the Japanese are very, very interested in as part of the long range research for the liquid metal reactor and breeder reactor development, as an example. It could also do advanced fuel testing of larger sizes than the EBR-II.

Senator FORD. Mr. Breckel, do you have anything to add to that?

Mr. BRECKEL. I would like to speak to that point, Mr. Chairman. I think in terms of comparing these two facilities perhaps it is that we should not view them as potential competitors. EBR-II has a niche that it can fill here within the next 13 years, but looking at the much longer life span of FFTF, its greater capacity, its greater flexibility in terms of conducting a wide range of activities simultaneously, clearly make it a facility for the future and for the long term.

If we are successful in marketing FFTF for international users for radioisotope production, and if we can generate significant outside revenues as part of those efforts, very clearly the cost to DOE in terms of running experiments in FFTF will come down. And that should, in our mind, hopefully provide an incentive to DOE to increase its use of that facility and to recognize that it is in its own interest to maintain the unique technical capabilities of the facilities for long-term use.

Senator FORD. Japan has been very central to your hopes for the future and income, apparently, and you are talking about establish-

ing a U.S.-Japan, I guess, operating partnership, am I correct, and that is what you are viewing?

Mr. NICHOLS. Yes.

Senator FORD. I would be concerned if such a partnership would cause us to give too much away to other countries. So let me ask you a couple of questions that come to mind. In your opinion, how would such a partnership work and who would get the most benefit out of the facility?

Mr. NICHOLS. We have not defined precisely how such a partnership would work, and that is one of the issues that the Japanese have also asked us, how they would participate in such a partnership for the operation and management of FFTF. We of course would not give away any information that had any sensitive or security related aspects to it.

Senator FORD. Would that be intellectual copyrights?

Mr. NICHOLS. There are some items that could be offered to the Japanese as part of this process and program for which they would receive value and for which we would receive money, and that is a standard process of licensing or issues like that with respect to intellectual property and technology development. Things like that have been done in the past in both the private sector as well as the Government sector.

Senator FORD. Do we need to be concerned about giving away too much in some kind of a contract like this?

Mr. NICHOLS. I do not believe so, Mr. Chairman, depending upon what we think as a country our future is in the long term for the liquid metal reactor and breeder reactor development. Right now the policy of the Government is not to develop breeder reactors. If that policy changes in the future, then we may have given away something that we in retrospect would not have wanted to give away.

But I think the situation in the world is such that we have got to pool all the resources and talents of the various efforts around the world in breeder reactor and liquid metal reactor programs so that the world gets the benefit of everybody's efforts, rather than each country trying to do something on its own.

Senator FORD. Maybe, Mr. Nichols, since you are from Westinghouse, it maybe should come from you, your opinion about how much it would cost to safely shut down the FFTF.

Mr. NICHOLS. We have been asked by the Department of Energy to prepare estimates in the eventuality that FFTF is shut down, and the numbers we have put together for the first year is on the order of \$72 million, is the number that I believe we have put together. This includes a fair amount of engineering studies, environmental studies necessary to decide exactly how to shut down and decommission the FFTF. It is unique in that it has got several hundred thousand gallons of slightly radioactive sodium that we have to deal with, and we have never dealt with that before, as an example. The total cost over a period of several years could be several hundred million dollars. We do not know precisely yet.

Senator FORD. You say it is \$70 million plus in the first year, and strangely enough, after you gave that statement to DOE they only requested \$28 million in fiscal year 1992.

Mr. NICHOLS. I do not believe that was the DOE request. I think that was the OMB pass back.

Senator FORD. Well, you see, you are outside Government and you can make those kind of statements. When you go through where they come from, they cannot make an honest statement.

Mr. NICHOLS. I understand that, sir.

Senator FORD. So there is roughly a \$40 million shortage in what it would take to clean it up the first year based upon what OMB asked for and what you think the first year would cost?

Mr. NICHOLS. Yes, sir.

Senator FORD. And how much would maintenance cost for de-commissioning of the facility? What would that cost?

Mr. NICHOLS. I believe over a period of several years, on the order of 5 to 7 years, it will be several hundred million dollars. We have not got a firm estimate on that because we have only started to look at it in detail.

Senator FORD. I see there is a lot of fast writing going on out in the audience, but you are telling me that over the next 5 to 7 years it would be several hundred million dollars, and \$70 million to close it down the first year? And that would be the first year's estimate?

Mr. NICHOLS. Yes, sir.

Senator FORD. And that would cost still some more beyond that? It looks like we are getting into lots of money here just to close this thing down. What is the cost of the Government to operate it now?

Mr. NICHOLS. The annual operating budget is in the range of \$80 million to \$85 million a year, it depends on—

Senator FORD. So we could run it for another 10 years for what it costs to close it down?

Mr. NICHOLS. It would still cost the several hundred million dollars, but at some time in the future so you would have some escalation to contend with.

Senator FORD. And that would give you a chance to put it into a payback position in that period of time, would it not?

Mr. NICHOLS. That is the potential.

Senator FORD. That sounds like what we say down in West Kentucky, swallow a camel, choke on a gnat.

[Laughter.]

Senator FORD. Do you have anything else, any other comments you wanted to make?

Mr. NICHOLS. No, sir. I thank you very much for the opportunity to appear before the committee.

Senator FORD. I am beginning to believe I am on your side. This hearing is adjourned.

[Whereupon, at 3:25 p.m., the hearing was adjourned.]

